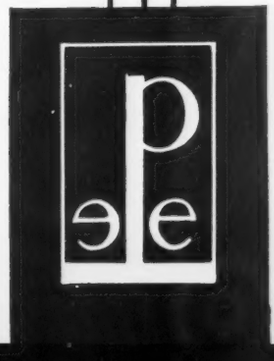
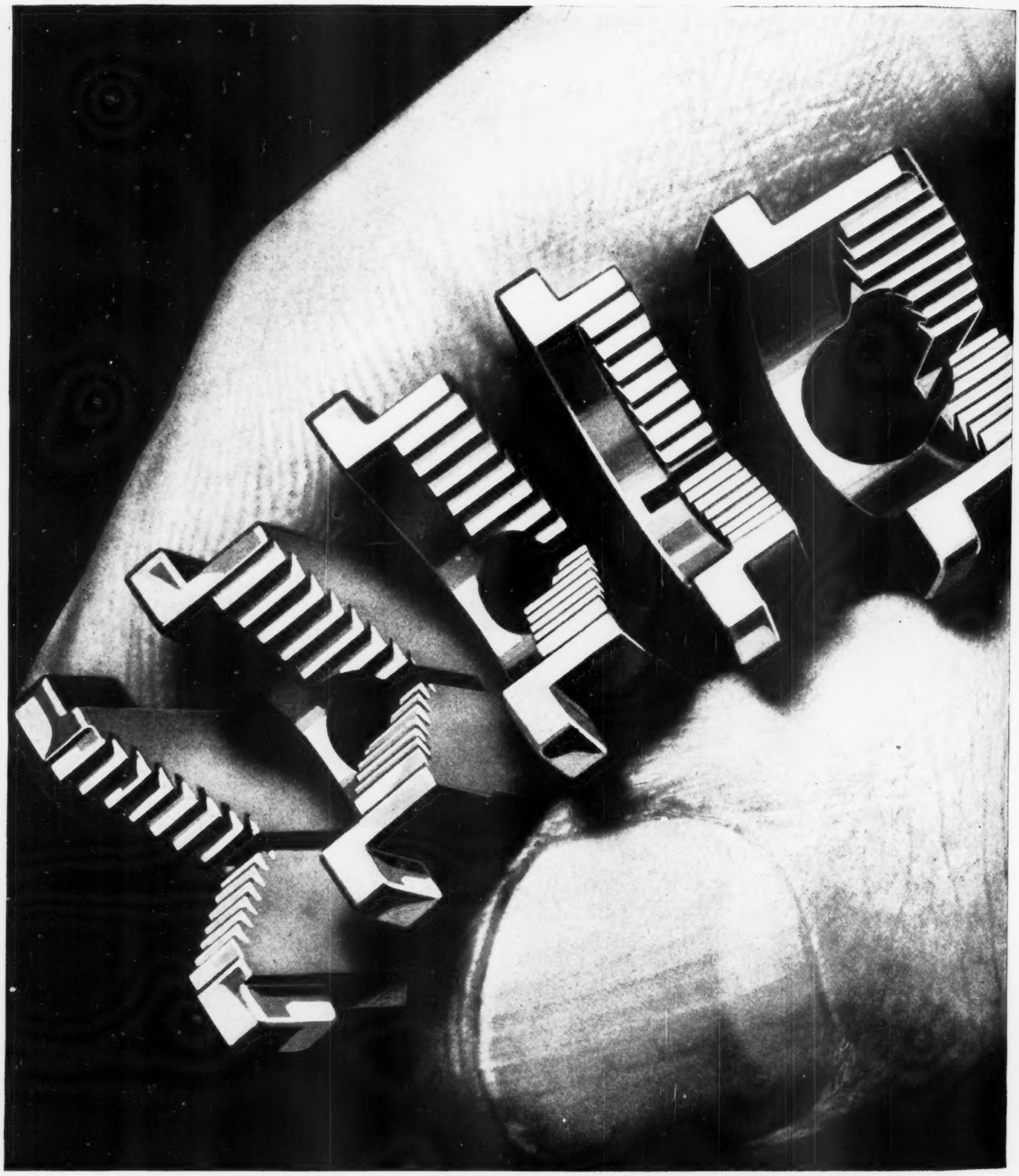
PRINTING EQUIPMENT ENGINEER



Edited for those concerned with the use and care of Printing Equipment

MAY
1931



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PRINTING EQUIPMENT ENGINEER

TRADE MARK REG. U. S. PAT. OFFICE ESTABLISHED 1910

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After you have read this copy, pass this magazine along to the other men in your organization. They will undoubtedly get helpful ideas from its pages.

Check in left column after reading. Note articles of interest.

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BLACK & WHITE

Contrast Matrix

"Contrast Provides VISIBILITY"

Culled from the March issue of *The Typographical Journal*—Official Organ of The International Typographical Union of North America.

A Matter of Mutual Interest.

Attention is called to the advertisement of the Matrix Contrast Corporation in this issue of THE JOURNAL. As is known, the processing of typesetting machine matrices by this concern is a boon to operators and an aid to employers. To the operator because of increased visibility of assembled mats over the relief of eye-strain and elimination of errors, to the employer because of increased efficiency of operators, saving of time and improved workmanship, all essentials in successful business. The resolution adopted by the Seattle convention in 1929 expresses the sentiment of the members of the fraternity on the product advertised

That every effort should be made by linecasting machine manufacturers to make the face of matrices readable to the operator without requiring undue effort to read same. That the black and white matrix is considered indispensable from a humanitarian standpoint, and that the co-operation of all subordinate unions throughout the jurisdiction of the International Typographical Union is recommended in bringing about the general adoption of same and that all local scale committees should endeavor when negotiating scales to incorporate the use of the black and white matrix or any equivalent matrix-coloring process which accomplishes the double object of making the reference character legible and at the same time neutralizing the light-reflecting power of the brass reference face.

The black and white matrix, approved by typesetting machine manufacturers and the International Typographical Union in convention, should interest all engaged in the machine composition business. Call your employer's attention to the matter It will benefit both he and you

Have you done anything to improve working conditions in accordance with the resolution passed at the Seattle Convention? (See Book of Laws, page 109.)

MATRIX CONTRAST CORPORATION

(Sole Licensees of the Percy L. Hill Black and White Patents No. 1466437, held valid by U. S. District Court, Eastern District of New York. Infringers will be vigorously prosecuted.)

33 West 42nd Street, New York

PRINTING
EQUIPMENT
ENGINEER
May, 1931

Fifth Conference of Key Men

(A. N. P. A. Mechanical Dept.)

Walter E. Wines, Manager, Mechanical Department, A. N. P. A. and Presiding Officer of the Mechanical Conference.

THE fifth annual mechanical conference of the American Newspaper Publishers' Association will be held at Washington, D. C., Monday, Tuesday and Wednesday, June 1, 2 and 3. The official headquarters will be the Wardman Park hotel. Convention sessions will be held both at the hotel and at Harding Hall, Government Printing Office. The hall is 15 minutes' ride from the hotel.

The convention sessions will be held at the Government Printing Office on Monday, Tuesday and Wednesday morning and on Wednesday afternoon, and at the hotel on Monday and Tuesday evenings.

The date for publication of the May ENGINEER, occurs too early to give complete detailed information of all the program features. However, some events may be mentioned.

At the opening session on Monday morning, B. L. Wehmhoff, technical director of the Government Printing Office, will make a progress report on the study of ink and paper. The report will probably be devoted chiefly to ink because most of the work during the past year has been on ink.

On Monday evening of the first day's session, T. F. McPherson, newspaper analyst, economist and developer, will speak on composing room cost records and their analysis. This, perhaps, will be the most interesting and valuable session of the conference, because composing room costs have been a universal bone of contention, due to a lack of standardization and the widely varying costs of production. Mr. McPherson has had a wide experience in the newspaper field. He has organized and established several newspapers. His business experience also includes a connection with the United Press. In October, 1917, he became business manager of the *Wisconsin State Journal* where he enlarged upon his knowledge in editorial and news direction. In 1919 he became general manager of a Tulsa, Okla., newspaper. In July, 1923, he became business manager of the Baltimore *News* and severed his connection with that paper in December, 1924.

Since October, 1927, Mr. McPherson has made studies for such newspapers as the Miami *Herald* and *News*, *Wichita Beacon*, Memphis *Commercial-Appeal*, Nashville *Tennessean* and the Knoxville *Journal*, Washington *Star*, Chicago *Tribune*, and *Oklahoman* and *Times* in Oklahoma City.

The work of the A. N. P. A. and the A. A. A. A. joint committee on advertising printing will also come up for discussion.

Some discussion will probably take place on the action of the International Association of Electrotypers in adopting a standard thickness (0.105 inch) for newspaper advertising electrotypes and the standard formula for backing metal, and if possible to bring about actual adoption of this standard by electrotypers and advertising agencies.

It has been announced that the various sessions will be strictly closed meetings for members of A. N. P. A. newspapers only and a few invited guests.

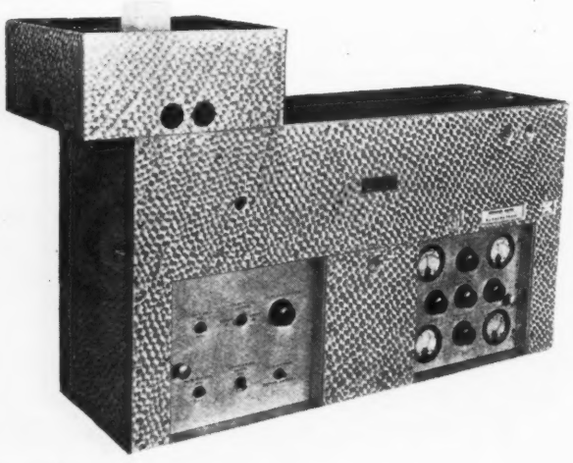
MANAGER SUBMITS REPORT

Mr. Wines submitted his annual report to the convention of the A. N. P. A. recently held in New York City. The report defines the activities and explains the research progress made by the mechanical department in collaboration with various other agencies during the past year. Cooperative work with the A. A. A. A. committee on advertising printing has brought beneficial results. Paper handling and newsprint waste have assisted members greatly. Investigational work at the Government Printing Office under the direction of B. L. Wehmhoff has been developed to a point where the publisher will benefit greatly from the study made of inks.

Automatic Analysis of Color

By JOSEPH RAZEK *and* PETER J. MULDER*

THE matching and numerical specification of the color of opaque and transparent objects is a matter of great importance to industries having color problems. The final decision as to a color match must be left too frequently to an individual who has, or appears to have, a "color sense" keener than the average. Just as in music an artist can pass final judgment on matters pertaining to pitch, quality, and intensity, so, perhaps to a lesser degree, many colorists must make the final decision as to a color. But, in the design of the



various pieces of apparatus for the reproduction and transmission of sound, it was found desirable to reduce sound to a definite numerical specification, involving the frequency and intensity, and to measure these quantities by highly developed instruments. So also, in the problem of color, a similar procedure is necessary. The measurement is then removed from the realm of personal opinion, and perhaps bias, to one of scientific exactness. Furthermore, with the reduction of color to a numerical specification, it is possible to maintain standards, entirely independent of the color itself.

Everyone has seen the rainbow, or the brilliant spots of color visible in an oil film. A similar effect can be produced when a narrow band of white light is passed through a triangular piece of glass, known as a prism. The narrow band of white light is spread into a much longer band of brilliant colors, shading from a very deep violet, indigo, blue, green, yellow, orange, and finally tapering off through the red. This is known as the visible spectrum. Actually, there is energy beyond both the violet and the red, known as the ultra-violet and infra-red, respectively, but we are now concerned merely with those colors visible to the unaided eye.

*Department of Physics, University of Pennsylvania, Philadelphia, Pa. Abstract of paper presented at the second conference of technical experts, Washington, D. C., March 15-16.

If in the experiment mentioned, light from a glowing gas, such as mercury vapor, electrically excited, is substituted instead of the white light, a totally different effect is observed. Instead of a continuous band of color, a few bright lines are seen. On close examination we find that the light from a mercury arc consists, almost entirely, of three kinds of violet light, a little robin's egg blue, some green, and some yellow light. Physicists have shown that light of different colors has different wave lengths. The wave lengths of the light visible to the eye varies from about 400 to 700 millimicrons, a millimicron being one-millionth of a millimeter, and so the wave lengths of visible light are very small indeed.

It has been found possible to determine the wave lengths of the bright lines of the spectra of glowing gases with an extremely high degree of precision. For example, the wave length of the bright lines of the mercury spectrum are known to be 405, 408 and 435 for the three violet lines, 492 for the blue line, 546 for the green line, and about 578 for the yellow line. (Questions of double lines are passed over.) These measurements can therefore be used for reference points in discussing the continuous spectrum. In the continuous spectrum, which is formed when white light is dispersed in a prism, all wave lengths, and hence colors, are present from about 400 to 700 millimicrons. In this way we can refer a pure spectral color to a numerical scale based on the wave length of the vibration. As a ready rule we can state that the violet can be taken as 450, blue at 500, green at 540, yellow at 580, orange at 600, and red at 660 millimicrons. It may be noted in passing that the specification of a color by the wave length is exactly analogous to the specification of a musical sound by the frequency.

The specification of intensity of color—that is, the determination of the amount of energy associated with the vibration of a given wave length—in absolute units is a matter of considerable difficulty. For the problems of color matching and color specification, the absolute value of intensity is unnecessary. Furthermore, the relative intensity can be quite readily obtained.

The color of an object depends on three main factors: First, characteristics of the object, itself; second, characteristics of the light falling upon the object; and third, characteristics of the eye beholding the object. The last two factors are extremely variable. The illumination varies from different degrees of sunlight to all kinds of artificial lighting. So also the sensitivity of the human eye is widely different for different observers, ranging from complete color blindness in one to an acute color sense in another. In addition the range of the spectrum visible to different observers

varies considerably. It is the extreme variableness of these two factors that makes the complete reduction of a color to a scientific basis an intricate and complicated procedure.

However, in the vast majority of cases, these variable factors may be avoided. Primary interest is centered on the other factor that affects the color, namely, the characteristics of the object for reflecting light, or the manner in which its surface reflects light. This is a physical property of the surface; directly susceptible to measurement, and a property that is reasonably constant in time. It is this factor only that is measured by any spectrophotometer. The other two factors must be noted in discussing the psychological aspects of color.

The reflection-factor curve plotted against wave length is a unique specification of the color of an object. That is, if two objects have identical reflection factor curves, their color must be identical. Another way to look at this is to note that in obtaining the reflection-factor curves of two objects, the operation is analogous to examining them repeatedly in all colors of light. If the two colors are identical when examined under all colors of light successively, they must be identical when examined by any mixture of colored lights.

However, the converse is not true. It is possible to have two colors appear identical in a given kind of illumination, say artificial light, and have reflection factor curves somewhat different. Such colors might not match in some other kind of illumination.

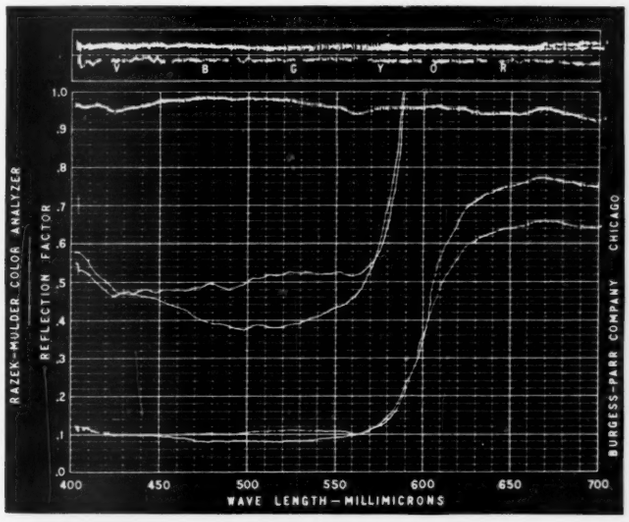
Assuming a given illumination and a normal eye sensitivity, as is usually done, the reflection-factor curve plotted against wave length provides the complete specification of the color of an object. It provides a permanent standard, since the color is referred to the color of a pure chemical, which, it is safe to presume, will not change with time. The curves can thus be used as a record which will not be affected by such factors as fading, chemical changes in secondary standards, etc.

When an object, oriented more or less at random, is examined by the eye, the light entering the eye is in general made up of two parts: Light from the primary source reflected from the object specularly, and light reflected from the object, diffusely. The former depends almost entirely on the surface conditions of the object, and the angular relationship between the primary source, the object, and the eye. The latter may be influenced by the same factors to some extent and is influenced to a considerable extent in the case of objects having much surface structure, but the diffusely reflected light is more dependent on the body color than on the surface conditions. This is especially true if the conditions of illumination are definitely specified and held constant.

In the instrument to be described, the samples are illuminated as nearly as possible from all sides, and the light normally reflected is analyzed. This is equivalent to looking at the sample through a long, internally blackened tube, while the sample is illuminated from all sides. In this way, any effect due to light specularly reflected is to a great extent minimized, if not entirely eliminated.

For the study of the specular reflection factor, it is only necessary to orient the sample so that light is directly reflected from the primary source to the instrument. This procedure will be of considerable importance in studying the problem of surface structure and gloss.

The Razek-Mulder color analyzer is an instrument which can be operated by the average operator and gives a continuous curve throughout the spectrum in a very short time. It is an automatic recording and indicating spectrophotometer, in which a photoelectric cell and a vacuum tube amplifier are employed.



Curves for two red samples from the same copy of a widely distributed weekly. The solid curve is the record for the darker sample, while the broken curve is the record for the lighter sample. Differences in the red as shown between 600 and 700 millimicrons are to be expected, as the samples were obviously different in brightness. The differences existing between 430 and 570 millimicrons, however, are rather surprising. These differences are verified and can be determined more accurately by examining the upper curves, near the center of the film, made by the second galvanometer set at five times the sensitivity of the main galvanometer.

It consists of several units assembled in a containing case about the size of a large suitcase.

The method of illumination for colorimetric purposes was developed at the Bureau of Standards. At present we employ twelve 15-candlepower bulbs, distributed uniformly over a nearly hemispherical aluminum reflector. The plane surface of the hemisphere, or top, is blackened inside and has at its center a small opening over which either the standard white or the sample to be tested may be placed. With the lights on, this gives intense illumination from many directions. The light reflected normally from the sample is tested. A chimney blackened on the inside, is provided to keep direct light from the bulbs from falling on the spectrometer slit.

This unit requires only 200 watts of power. In addition, the time during which the sample to be tested

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Routing Work Flow in Commercial Plant

By Meiric K. Dutton

The efficiency of a commercial printing plant must depend to a great extent upon the arrangement of the productive equipment of that plant. Production control, including both pre-planning and follow-up, is virtually impossible of attainment unless the departments are logically arranged in sequence as to the operations to be performed and unless the equipment within each department is properly laid out as to location and working space.

It is obvious that the limitations of the building in which the plant is located greatly influence the procedure to be followed in planning the flow of work through the many operations. Because of these limitations as well as the varying classes of work to be handled, it is impracticable to attempt the establishment of any definite code to be followed locating the equipment in a commercial printing plant.

CLASSES OF LOCATION

Four general classes of location must be considered in discussing the site of the printing plant. The plant may occupy a building which has been erected for and is entirely devoted to the business of the one printer. It may be housed in a building with other printing plants or with plants of the allied industries. There are many such buildings in the printing centers of America, these buildings having been designed especially to meet the requirements of the printing trade. A third type is that in which the plant is located in a combination office and factory building. The fourth location which must receive consideration is that in which the printing plant has adapted a factory which has been remodelled to meet the requirements of the printing trade.

It is clear that each of these various locations of the printing plant will require a different planning of the equipment. The type of construction of the building will impose further difficulties in the way of the person who is to allocate each machine to its proper place. A single-story building may be so designed as to have a minimum of posts to obstruct the planning, while a plant located on an intermediate floor of a metropolitan building may be severely handicapped by the frequency of posts and by the absorption of a great portion of the central floor space by elevators which must serve offices located higher in the building.

SUBURBAN LOCATION IDEAL

A suburban location which will permit the erection of a building specially designed to meet the requirements of the specific plant doubtless is the ideal. But it is all too seldom that one encounters this ideal. Nearness to the market is often too great a factor to be denied and our printing plants continue to center in metropolitan areas which necessarily impose certain limitations. Increasingly, however, it has become possible to locate printing plants at greater distances from the markets. This trend is constantly accelerating due to the increase of transportation facilities, the increased use of the telephone, the introduction of the teletype, and the gradual change in ideas. It may be that television still further extend these limits of distance and increase the ease of long-distance handling of printing orders. The choice between a single-story and a multi-story building is dependent on the nature of the business and the amount of building space available. A suburban site will generally permit of one or two-story building constructed in such a manner that a clear and direct sweep of materials may be arranged to flow through the plant. In such a building it is comparatively simple to arrange for proper light and ventilation. The urban site must be more carefully selected and arranged. High ceilings and maximum window space to provide both light and ventilation are essentials in the city building.

PLENTY OF LIGHT ESSENTIAL

The printing plant must be plentifully supplied with light because of the close character and high quality standard of the work; it must be well ventilated, must be so constructed as to support heavy loads, and must be well provided with vibration isolation. Proper placing of elevators to insure greatest convenience in the handling of materials is an essential to the proper placing of machinery.

PRINCIPLE OF DIRECT FLOW

The commercial printing plant differs from many other industries in which the proper flow of work has most thoroughly been studied. Most machine shops and foundries start their first operation with a piece of raw material which is carried through successive operations until the finished article is evolved. Except for the composing room, this raw material of the printing plant is paper and the flow of paper through the plant will offer an index of the productivity of the plant. Although the printing industry is somewhat more complicated in the operations it performs and in the fact that it manufactures to customers' specifications rather than for stock, the principle of direct flow of work through the plant is no less applicable and is much more essential in the printing industry than in many other less complicated industries.

The natural features of each particular plant vary to such an extent that it is impossible to apply absolute rules to govern the making of a flow sheet for the printing plant. It must emphatically be said, however, that no attempt should be made to place machinery either on a floor plan or on the floor itself until a flow

Continued on page 24

A Rubber Roller Grinding Equipment

By MAC SINCLAIR

SOME time after the introduction and perfection of rubber rollers for use on newspaper presses, it was found that a resurfacing problem had been brought about. After a long period of use, rollers swell more or less at the ends which renders them unfit for use until they are made of constant diameter again throughout their length.

In plants where the investment in rubber rollers is heavy it was found that it would be profitable to install grinding equipment so the rollers could be restored to their original condition on the premises. This obviates the necessity of shipping rollers out to have them resurfaced.

The grinding equipment to be described has been in use for a considerable period of time at the *Cleveland Plain Dealer*. Tom Pentland, boss machinist, with the cooperation of H. J. Graham, superintendent of maintenance, devised a roller-grinding and polishing mechanism which, it may be said, turns out all that is to be desired in the way of resurfaced rubber press rollers. In fact, carefully kept records showed that its operation during the first year paid for the installation cost of the equipment and returned a 31 per cent profit on the investment.

THE EQUIPMENT

The equipment comprehends installation of a standard type lathe which can be converted into a grinding mechanism by the addition of grinding, dust-collecting and polishing units, with suitable controlling devices necessary to complete the work in the proper manner.

A medium-priced lathe was selected which has a 16-inch swing and 12-foot bed length. The lathe is operated by a 1 h. p. motor suitably connected through jack and countershaft to obtain the necessary rotation speeds.

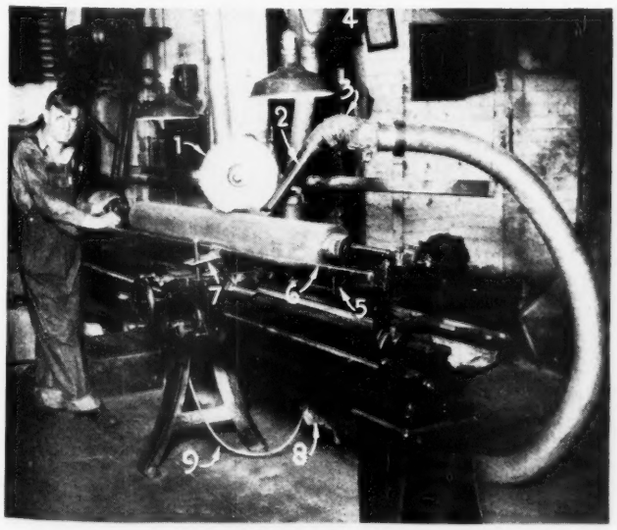

Fig. 1.—Rubber roller grinding equipment devised by Tom Pentland for use in the plant of the "Cleveland Plain Dealer." The conventional type lathe is equipped with a grinding unit 1, a suction unit 2-3-4 to collect the rubber particles removed in the process of grinding, and a "sling" mechanism 5-6-7-8 with which to automatically polish the roller after grinding.

The rubber rollers to be ground are mounted in the lathe on ordinary split-cap type pillow blocks. The various size rollers have different diameter bearing spindles, and it was found necessary to provide the right size pillow blocks to accommodate them. All of the pillow blocks are made to support the roller centers at a common fixed point parallel with the lathe bed by the addition of steel liner plates affixed to the bottom of the blocks. The pillow blocks thus automatically center each roller regardless of its bearing diameter. Since the actual grinding operation is done from the top of the roller as mounted in the lathe, it is not essential that each one be tested for side parallelism with the line of carriage travel.

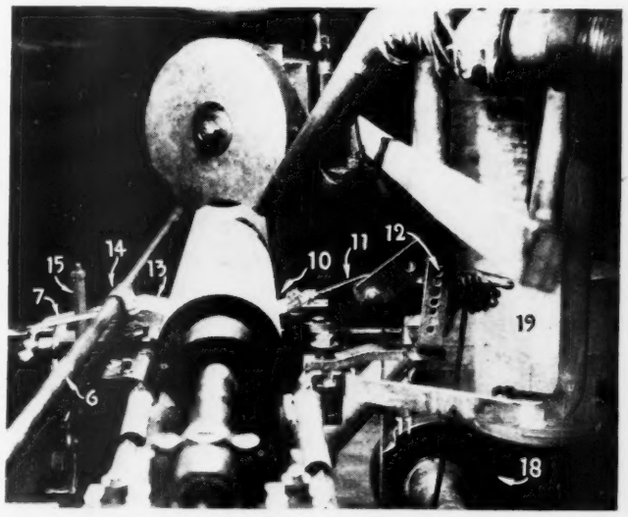

Fig. 2.—Polishing mechanism used to finish rubber press rollers after grinding in the plant of the "Cleveland Plain Dealer." The "sling" proper 10 is made from No. 60 or 80 grade Aloxite cloth, 4 inches wide by about 12 inches long. One end of the cloth is attached to a yoke 14 which is supported by the guide rod 6. Forming a part of the yoke 14 is a fork 7 which straddles post 15 on the bed carriage. The sling 10 is held upwardly against the rubber roller by means of the tension exerted by a 10-pound weight 8, Fig. 1, suspended at the lower end of cord 11 which passes over a pulley on bracket 12. The bracket 12 is supported by an arm attached to the rear end of the carriage. As the carriage travels back and forth upon the lathe bed, it causes the Aloxite polishing cloth to also travel from one end to the other of the revolving rubber roller.

The sling guide rod 6 rests upon two arms, one of which is shown at 5, Fig. 1. The rod 6 is placed at a 4-inch angle to the axis of the rubber roller, which causes the contacting part of the polishing cloth 10 to gradually change and small portions of the French chalk placed upon the cloth at 13 are caused to be drawn between the cloth and roller.

The sling tension arm 12 is adjustable for different size rollers so that the area of contact of the Aloxite cloth will be approximately 1½ inches of the periphery of the roller. Too much contact area would set up friction which in turn would cause heat to fill the cloth with rubber particles.

THE GRINDING UNIT

The grinding unit is also of standard type. It consists of a 1 h. p. motor with a grinding wheel mounted on one end of the armature shaft. The cable which carries the wires for the motor is indicated at 9, Fig. 1.

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Highlight Halftones For Newspapers

By FRED F. UHL

ADVERTISERS are constantly seeking a way to improve the quality of the illustrations they use in their newspaper advertisements and have lately shown a decided preference for the "highlight" (so-called) halftone. The final results in most instances are not up to their expectations, but invariably the fault is in the original copy, as few artists are experienced in making this type of drawing.

Also, many advertisers who do not understand that special treatment is required when reproducing a drawing for a highlight plate send their copy to the engraver with instructions to "rout out" or "etch out" the whites. This, of course, can be done only in the case of the simplest design which invariably results in a crude job.

Some drawings, if not too complicated, can be photographed and the highlights painted out on the negative, but this is a slow and expensive operation and is hardly justifiable in the average newspaper shop. The usual method for reproducing such copy is to make a halftone negative the size of the cut, using the regular screen, make a contact photo print and have the artist paint in the whites and strengthen the shadows where necessary, then reproduce this retouched halftone photo print the same size. In some instances, if the subject is suitable, the job can be enlarged slightly, making the screen somewhat coarser, thereby making a very effective cut.

However, to produce a real highlight plate, more than ordinary skill is required on the part of the halftone operator. He also must have a copy that has been carefully made by an artist who understands the photographic value of the medium with which he is working.

Copies drawn for highlight rendering should be a rather warm color in the deeper tones. Middle tones may be shaded to any point the artist desires, he bearing in mind that there should be quite a distinction between the lightest tone or wash and the chalk white paper, as the light tone must carry what would ordinarily be the highlight dot, the white paper being blocked out entirely.

The operator, in making the negative, may use any one of a number of methods for producing the negative. Some operators merely "plug up" the highlights making them too fine to print and hold in etching. Others have a set of trick diaphragms with which very good results may be had, as they are designed to diffuse the light passing through the screen from the white part of the copy, veiling over the dots without greatly affecting the rest of the negative.

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The half-tone (No. 1) shown above, was made in the usual manner from an artist's wash drawing. This has been the conventional treatment over a long period of time.

This engraving (No. 2) was made from the same drawing as shown in No. 1. A special highlight diaphragm was used to block out the background and whites in the picture.

Wanted « » A Few $25,000-a-Year Men

By R. J. BARRETT*

IN A RECENT conversation with Captain Ruth, production manager of the Washington *Star,* we discussed the lack of facts available on production costs of a newspaper, in comparison with other lines of manufacture, even the commercial line of printing.

It is true the statistics are thorough on advertising lineage and circulation, but these figures cover loss or gain in volume of production only. They do not cover production costs.

From available facts on circulation and advertising it is a simple matter to make comparisons with past years and see where an exceptionally good job is being done.

Editor and Publisher and other publications devote pages to achievements of these successful publishers, advertising managers, editors, and circulation managers, and facts on how they did it. This naturally opens avenues for advancement for these men and the men under them.

In these same publications you will read columns on the high percentage of gross revenues that goes into composing room costs of producing a paper, and never an article regarding statistics or comparisons over a period of years relating some exceptional achievement in a mechanical way, with enlightening facts applicable to other papers.

There is nothing spectacular about a capable composing room executive. In some cases he does not even realize his own capabilities.

Articles printed covering mechanical departments generally cover the subject of reducing the column width from 12½ ems to 12 ems, how to save waste paper, and why are less ems produced per mechine man today, with higher wage scales, than ten years ago?

All effort seems to be devoted to developing, rewarding and praising the men who can increase the intake of the cash register. Very little is heard of the mechanical men who do or can help decrease the outgo.

If a publisher seeks a new superintendent today, where will he find available facts in newspaper statistics that will lead him to his man?

The fact that a composing room superintendent is employed by a successful newspaper does not necessarily imply that he is above the average as a capable executive with low production costs. There are many superintendents on second or third string papers, who are making wonderful records if facts other than the advertising lineage and circulation figures are analyzed.

There must be something fundamentally lacking in an industry, where as high as $1,500,000 annually can be spent only on labor charges in the composing room, and the only statistics published consist of the number of lines of advertising, and occasionally an article on the number of ems operators average daily.

With these conditions prevailing it is hardly possible the problem will solve itself. The guidance and help must come from the publisher.

In my opinion the best thing that could happen to the newspaper industry, in a mechanical way, would be the creating of a few $25,000 a year superintendents. There are men capable of earning that amount. The result would be more ambition displayed in trying to find out why these men were able to earn these salaries. Superintendents would start taking personal inventories, and try to show why they were worth a certain percentage of these amounts. The effect would be apparent all the way down the line.

Seven years ago, previous to my present connection, I was composing room superintendent of the *Akron Times,* a seven-day paper, six afternoons and Sunday. Two Cleveland morning papers sent early bull-dog editions into our city Saturday evening. We had been going to press at midnight with our first edition. A decision was made to compete with these Cleveland papers by coming out earlier with a complete Sunday paper at 6:00 p. m. The last edition of the afternoon paper went to press at 4:00 p. m.

A conference of department heads was held and I was asked to state what copy deadlines were necessary to insure an edition six hours earlier.

The surprising thing was, the first week we were ready an hour early with the starter page. The costs with the extra edition were lower than the previous week, as the night work consisted solely of makeovers for live news, and late classified ads. Many printers who previously worked on Saturday night and took a day off during the week were put back on six days, which they naturally liked.

The first Monday after the new edition I called on the publisher with figures on cost and told him: "If these costs rise, you are responsible—not I. Last week you let me tell the department heads what I desired in the way of cooperation, and I was virtually in charge of the editorial and advertising departments. Now, what I look forward to is, these departments will start easing up, my costs will increase, and in about six months you will be asking me why I could get out the first edition with no apparent pressure and low cost, and be intimating there is something wrong with the composing room, when the facts are it is up to you to keep the editorial and advertising departments cooperating, as they did on this first edition."

W. H. B. Fowler, general manager of the *San Francisco Chronicle,* in *Editor and Publisher* of February 14, 1931, says: "The newspaper business first started to solve problems of inefficiency during the war when

*President, Matrix Contrast Corporation, New York, N. Y.

economical practices were compulsory. Some problems remain. I believe that the greatest need of most newspapers today is someone who thoroughly understands composing room costs. A specialist in this could command his own price."

I agree with Mr. Fowler that some problems remain, but do not agree that a capable man could command his own price.

After working as a foreman for fifteen years and calling on publishers and foremen for the past six years, I make the foregoing statement sincerely.

During the first year I was on the road, a publisher of a chain of newspapers offered me a position as mechanical superintendent of the chain—a newly-created position. While I was not interested in the offer and told him so, he finally insisted I make a proposition. The offer I submitted was based on a percentage of savings effected. It was rejected because he thought the salary involved would be more than any of his publishers received, and he did not wish to creat dissatisfaction.

None of the publishers in the chain could accomplish the object desired, but still their feelings were paramount to savings.

Upon numerous occasions, while calling on publishers, they have brought up the subject of mechanical costs, and stated they thought their composing rooms were inefficient, some placing the amount they thought could be saved as high as $100,000 annually. I asked these publishers: "Would you consider paying a capable superintendent 15 to 20% of this amount if he could reduce costs to that extent?" The answer has always been "No!"

These same publishers would pay an income tax expert 50% of any rebate he could get from the government, or a lawyer the same amount to win a suit, and furnish all the assistance and personal effort possible to help win the case, because the publisher realizes he is not capable of doing it himself and is willing to pay the person who can.

The lamentable fact is, capable superintendents nine times out of ten, are too easily satisfied with what they have attained. In most cases I find they lack the necessary vision and salesmanship as to how to go about selling themselves.

Today the superintendent in the city of approximately 500,000, when questioned says: "Why would I want a superintendency of an office in a larger city? It would not pay very much more than I am now receiving, and consider the extra responsibility and what I would have to go through to make it a smooth running organization." This same condition prevails in smaller cities. The capable man who has gone through the procedure of straightening out an inefficient plant is not very desirous of repeating the operation.

One thing any capable superintendent realizes—and the publisher does not—is that to have an efficient composing room, the same condition must prevail in the editorial and advertising departments, over which the superintendent has no authority.

It does not require much thought to realize how reporters with late spot news, and advertising men with late ads or proofs, each intent on advancing himself in his own department, regard the foreman's problem of an efficient composing room with low operating costs.

The biggest obstacle a new or old superintendent encounters is to get support from the publisher for a sufficient length of time to prove what can be accomplished in a composing room with cooperation and coordination of copy, according to the facilities and available daily hours at hand.

I do not believe personally that you will find an inefficient composing room in a paper that has an efficient editor and advertising manager. These two heads would bring enough pressure to bear on the composing room to straighten it out.

Reversing the previous paragraph—let a capable new superintendent, who realizes the value of cooperation from these two departments, attempt to raise the standard of either without the aid of the publisher, and he is very apt to be out of a job in a very short time.

What the publisher desires in a superintendent today is a "miracle man"—one who can conduct an efficient composing room with low operating costs without disturbing other departments.

Can you visualize an efficient automobile assembling room with low costs, with every outside department ordering parts and supplies, using their own judgment as to when the parts should be delivered to the assembling room?

The connection I now have calls for a check of news and ad proofs of composing rooms. This is given free to all who desire it.

To date we have checked the proofs of at least 20% of the operators on newspapers in the United States.

With all these statistics and comparisons we have found much of interest to any superintendent or publisher who is interested enough to take the time and go thoroughly into the subject. In many instances we have been able to show a weak spot in methods that called for no expenditure to correct and which was corrected as a result of our advice and experience to the profit of the publisher.

Intertype Vogue Extra Bold

Intertype announces the plan to add Vogue Extra Bold with Oblique to the Vogue family of matrices for line composing machines. An example is shown below in the 14-point size.

This is Intertype
Vogue Extra Bold

With the addition of this new series Intertype Vogue will include three weights—light, bold and extra bold.

Intertype Vogue was among the early successful sans-serif faces designed for line composing machines and is in general use throughout the country.

Vogue Extra Bold with Oblique is being cut in sizes from 8 to 14 point. Both the bold and the oblique will also be made in the larger sizes.

Pre-makeready Methods And Machines

By L. W. CLAYBOURN*

L. W. Claybourn, President of Claybourn Manufacturing Co., Milwaukee, Wis., and Leading Exponent of Precision Methods for the Printing Industry.

IF we are to reap the full benefits of mechanical precision, ways and means must be employed to permit the making of precision plates mechanically that will meet this ever-increasing demand for this commodity at a cost that is within reason. Thus the publishers of large newspapers and magazines can participate in national advertising in their publications so as to adequately portray and exemplify merchandise which is being sold through this advertising medium.

For this reason, we have spent thousands of dollars in development work to this end, that we could produce the key to successful cast plate operations. Precision machinery and care must be used in their production to obtain the accuracies necessary to acquire the same printing results as are obtained by more expensive methods now in use.

FIRST OPERATION IN MAKING PLATES

First and most important of all operations is the attention that must be given the locked-up form or subject matter which is to be molded. Adequate chases with proper and substantial bearers must be provided; all cuts and materials must be of one height, and the chase must not spring under lock-up tension.

It must be remembered that this is a duplicating process and it is not to be expected that a mold of greater accuracy can be produced than is inherent in the form which is to be molded. If cuts are of various heights, if the chase springs under lock-up tension, or if the materials in the form itself do not justify properly, then the mold taken from such a form will likewise be faulty. There is no mechanical means which will correct these gross inaccuracies, which originate in the faulty locked-up form. The casting of a quality printing plate depends entirely upon a perfect mold, and the foundation for making a perfect mold depends upon a well-justified form, which is proved to be mechanically correct by printing tests.

*President, Claybourn Process Corporation, Milwaukee, Wis.

PRECISION PROOFING

There is only one definite way to determine the condition of the form which is to be molded, and that is by proofing this form for its printing qualities and correctness of materials as to height, etc., on a precision proof press, designed especially for the purpose. The examination of such a proof will definitely determine the fitness of the form for reproduction. This safeguarding operation positively eliminates the dissipation or further waste of time and expense of trying to produce good printing plates before the form has been definitely corrected in every detail so that good molds may be secured. This is the only means that will permit the operator to detect any faults that may exist in the form.

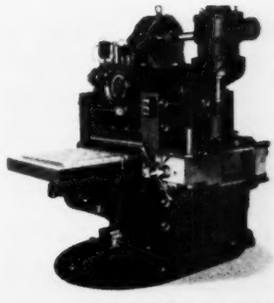
A special lock-up chase with steel type-high bearers that will not spring under lock-up tension will assure perfect justification and a precision lock-up throughout when accurate materials are used.

MOLDING TO RETAIN FINE DETAIL

Never before has the strength and accuracy been built into a machine for the purpose of molding lead or mats which is present in the molding press which we have recently perfected. After a long experimental period we discovered that it is mechanically impossible to maintain the accuracies that are necessary in molding the fine detail etched in halftones when heat is present in the machine itself. This is due to contraction and expansion of the massive machinery necessary for making such molds. Therefore we forsook the old practice and made a separate drying unit which permitted the drying of the mat under pressure contact and eliminated the harmful action of heat on the molding press unit. We thus maintained the definite accuracies that are necessary in precision molding in order to reproduce the most minute detail of the original plates or forms from which the molded impressions are taken.

ELIMINATING MECHANICAL DEFLECTION

We also discovered that to elminate mechanical deflection when the machine is under extreme pressures, a far greater strength was required to maintain the accuracies necessary for precision molding than is required for merely obtaining impression. This excess strength prevents injury to the materials being molded, formerly caused by the deflection of the machine itself under pressure.



Direct pressure molding from either type or half-

Continued on page 25

Standardization and Air-Conditioning

By WILLIS H. CARRIER*

Willis H. Carrier, an Authority on Humidifying and Ventillating Systems for the Printing Trade.

WHEN we speak of standardization, we refer to the general movement to reduce or, better, to elevate the printing industry from the status of a handicraft to that of a standardized manufacturing industry whose technique and processes are capable of so-called "scientific management."

In respect to the fact that paper stretches and shrinks under varying conditions of relative humidity; that rolls, plate mounting, inks, and other materials used in the industry are affected by varying changes in temperature and humidity; and that the installation of apparatus for controlling these variations will, or should, overcome a number of these difficulties, we believe these premises to be already accepted in the industry, at least in the more progressive portion of it.

STANDARDIZED METHODS GIVE CONTROL

Practically every advancement in the technique of the graphic arts, as well as other industries, has been in the direction of standardization of processes and material, that is to say, the reduction of manufacturing materials and methods to a simplicity capable of accurate measurement and control; that is to say, again, we have striven to eliminate the rule-of-thumb craftsman, who by virtue merely of years of experience and "cut and try" methods can arrive at tolerable results with uncertain and unforeseen materials and methods, and to replace him with standardized methods and materials which give, in effect, their own control.

Up until very recently there seems to have been what the early scientist called "a conspiracy of nature" to prevent printing production being reduced to measureable standards. In fact, we venture to state that a large majority of so-called practical men in the industry would still assert that the industry is inherently incapable of standardization.

We recognize that printing (a made-to-order business) has many congenital obstacles in this direction. Nevertheless, we submit that the immeasureable, or at any rate rather hitherto immeasurable variables, are being solved out of the problem, and we see no reason why they should not all eventually be reduced to workable limits.

Of the variable factors which make the application of standards of the industry so difficult, it now appears that one of the first is *weather*. The average progressive printer recognizes that varying atmospheric conditions have a distinct influence upon his production and that the installation of air-conditioning equipment has given favorable results in those plants which have installed it. He is, however, confronted, as far as concerns him personally, with a double problem: First, how to determine the economic value of air conditioning to his own plant; and second, presuming that his findings show the desirability of installing such a system, what sort of system he should install.

FALLIBILITY OF TIME TICKETS

In studying this problem with printers, just as the air-conditioning engineer is required to do in nearly

Continued on page 18

*President, American Society of Heating and Ventilating Engineers. Abstract of paper presented at the second conference of technical experts, Washington, D. C., Printing Industries Division, A. S. M. E.

William Feather's Reflections on Business

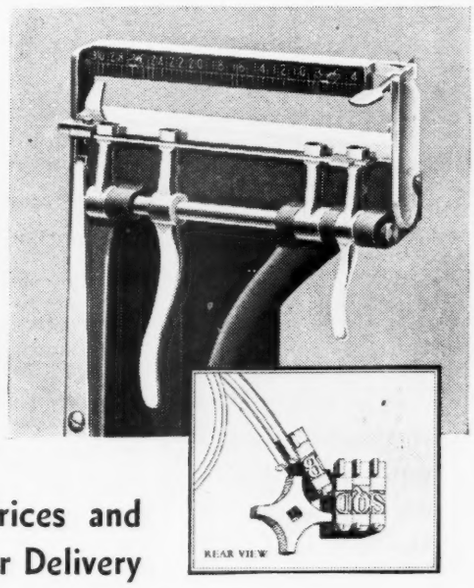
William Feather, President of the William Feather Printing Co., also contributes to Nation's Business, Philadelphia Public Ledger, New York Evening Post and Chicago Daily News.

THERE is a time in the life of every business venture when just a few hundred or a few thousand dollars are necessary to turn the tide. Most business men have had the experience of trying to raise this money to meet a crisis. It's as hard to find as a left-handed monkey wrench.

A few months later, the tide having turned, ten times the sum may be raised with one-tenth the effort.

In retrospect the experience is amusing; at the time it's paralyzing.

LINOTYPE LEADERSHIP



Offset Assembling Elevator

—Protects Matrices and Insures Smoother Delivery

A distinctive and exclusive feature of the assembling elevator is the ingenious arrangement by which incoming matrices are prevented from striking the area around the side walls of matrices already in the assembler.

The inset illustration above shows the relative position of the assembled matrices to those that are entering the assembler. Notice that the entering matrix strikes the matrix in the assembler well off to one side, and does not strike within the side wall area at any time. This feature is an important element in preventing damage to side walls of matrices during assembly, increasing the life and usefulness of a font of matrices.

It also insures smooth assembly, as a perfectly smooth surface in the side of the assembled matrix is presented to the matrix entering the assembler, with no sharp corners of the routing or separating bridge of a two-letter character to offer interference.

TRADE LINOTYPE MARK

MERGENTHALER LINOTYPE COMPANY

BROOKLYN, NEW YORK · SAN FRANCISCO · NEW ORLEANS
CHICAGO · CANADIAN LINOTYPE, LIMITED, TORONTO, CANADA

Representatives in the Principal Cities of the World

LINOTYPE METRO FAMILY 560.30.11-B

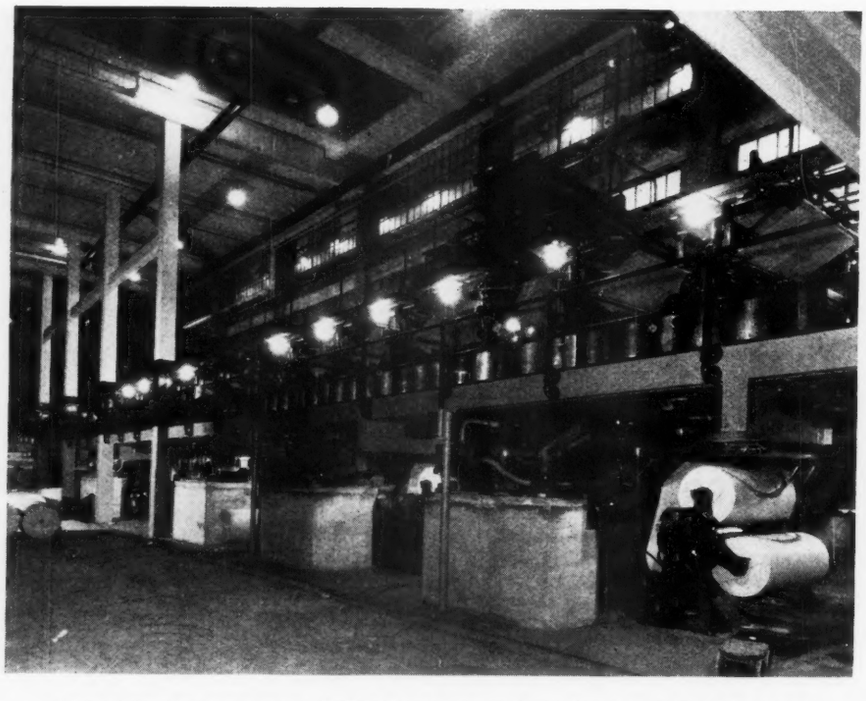
Buffalo Courier-Express Installs *Vapo Systems* High Speed Web Conditioner

• • •

TO add a finishing touch to its new and modern newspaper plant, the Buffalo Courier-Express has installed Vapo Systems high speed web conditioners on its presses, and is experiencing the many benefits of this new time-saving and money-saving invention.

Mr. W. J. Conners, Jr., enterprising publisher of the Courier-Express, was quick to realize the advantages of eliminating costly web breaks, static electricity and flying ink particles and paper dust. He is well satisfied with the results accomplished through the operation of Vapo Systems heads, which apply a fine vapor mist on the speeding paper web as it leaves the roll and enters the printing cylinders.

The plant of the Courier-Express is a model of cleanliness and efficiency, and Vapo Systems equipment will help to keep it up to the high standards set by its owners.



View of press line installation of Buffalo Courier-Express, from the reel room level. The plant is equipped with Goss press units and Cline electric reels. At the present time the Courier-Express is running around 130,000 daily and 190,000 Sunday circulation.

Handsome new building of the Buffalo Cou press, on newspaper plants in the country, and the first me an dail the modern method of high speed web conditione plant on November 14, last, and is a model of efficienc

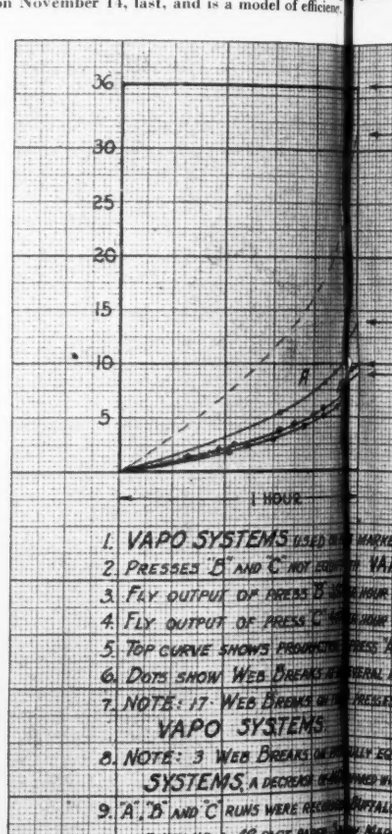


Chart showing comparative runs made of the Buffalo Courier-Express. Press A, equi with Vap a collect run of 48-pages, four parts, 13,000 co papers of 31,500 an hour. There was one web break Presses B and C, operating at the same speed, heads, delivered at the fly each 9,580 and 9,0 on one and eight on the other.

Vapo Sy Incorporated

211 W. Wacker Drive Publisher use—Va

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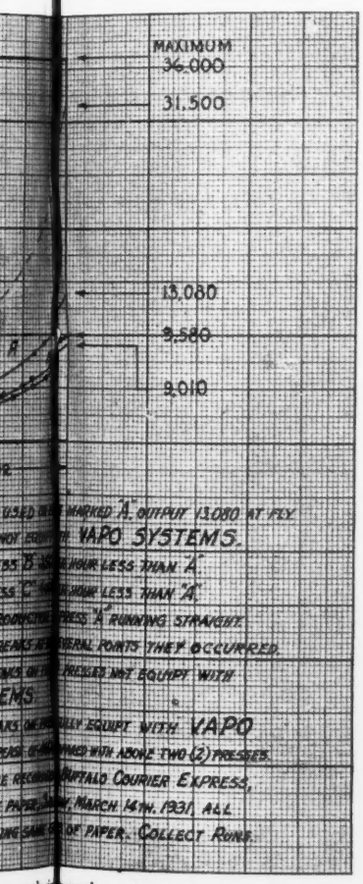

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rated

ublisher se—*Vaporize* **Chicago, Ill.**

Save Time and Money with *Vapo Systems* Automatic High Speed Web Conditioner

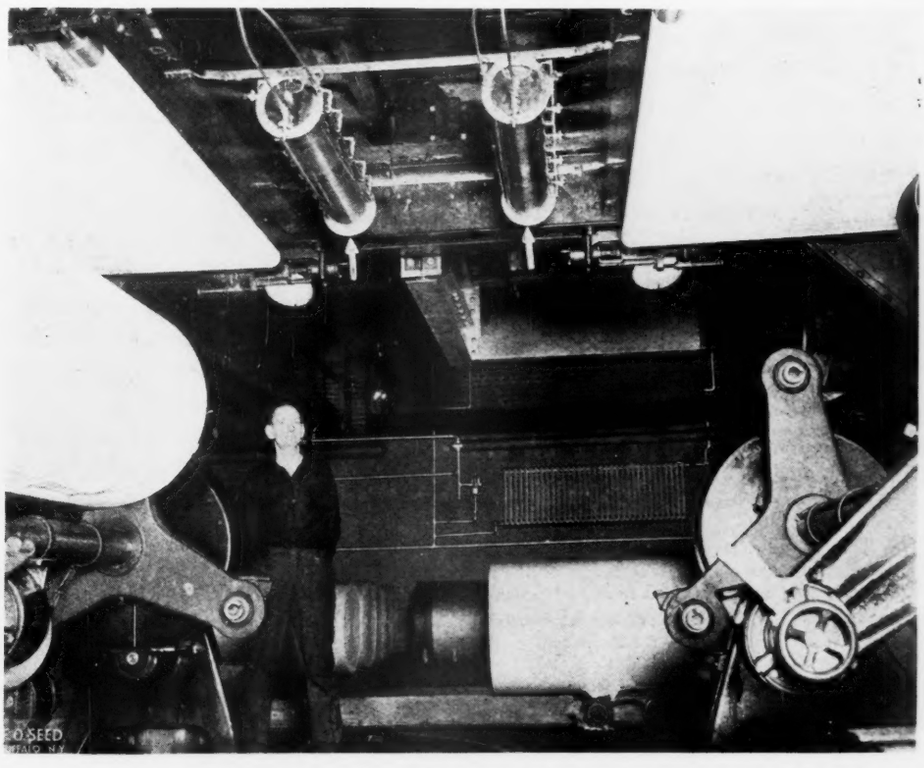
• • •

ECONOMY is not merely a business virtue today — it is a real necessity!

"Saving dollars" is all right where wisely applied, but it is poor policy if dollars are saved at the expense of valuable time or at a sacrifice in quality of product. This is particularly true in the newspaper publishing business.

The broad benefits and economies derived from the use of Vapo Systems humidifying apparatus justify the comparatively small expense of installation, and the equipment will last as long as the presses.

Write today to Vapo Systems, Inc., 211 West Wacker Drive, Chicago, for information that will explain how you may eliminate ninety per cent of your press room troubles, whether you are publishing a newspaper or operating a job printing business.



View showing installation of Vapo Systems humidifying device in press room of the Buffalo Courier-Express. Overhead, in the center, are shown two Vapo heads in action between two press units. The heads spraying the other side of the web are hidden by the paper feeding into the printing cylinders.

Continued from page 14

every industry he encounters, the logical and scientific way to go about the question of the value of an air-conditioning system would be to take one's time tickets, roller bills, ink bills, and other records of machine operation and material used for the course of a year, and from an analysis of these make an estimate of the loss in production and spoilage of material resulting from uncontrolled atmospheric conditions. The difficulty with this method is that it seems to be impossible. We have yet to find, and do not believe there exists, a printing plant whose time tickets are sufficiently accurately classified, or sufficiently conscientiously kept, to show the losses in production and stoppages of machinery, or spoilage of work due to any particular cause, whether it be weather or anything else. There are, of course, specific items which would be taken from tickets, such as total time for reregistering forms or for remaking plates, but these are only a small part of the whole influence of weather. No time ticket, as far as we know, has ever been designed or used which will show the 3 minutes a pressman will stop a press to reset a slightly swollen roller; the 20 or 30 impressions per hour that a feeder may lose due to slightly wavy stock or a slight amount of static; or the 5 or 10 minutes makeready time which may be taken resetting guides where sheets are stretched slightly but not enough to make necessary reregistering the form. These are the items, individually rather insignificant, whose total adds up over the course of a year to a distressingly large financial loss.

As we have said, it is practically impossible to segregate the individual items of loss caused by atmospheric variations. Nevertheless, we can and have secured a fair approximation of their total from the showing made by their elimination in conditioned plants.

ITEMS OF OPERATION AFFECTED BY WEATHER

Let us examine the *items of operation* in the pressroom as affected by weather:

(a) This operation involves registering the form, and in this connection we have found that modern furniture and blocks are sufficiently influenced by humidity seriously to affect the operation time. We have found, for example, that mounted plates show an average distortion from type high three times as great when stored in unconditioned areas as in conditioned. This results in increased underlaying and interlaying time. Registering the form also involves reregistering in cases when the stock has changed size between runs.

(b) After registering the form, make-ready time includes setting the guides. This will have to be done again if the stock has changed between runs.

(c) Make-ready time also involves the cylinder, and if the humidity changes greatly during the course of the run, the packing may become soft and baggy and have to be changed.

(d) The making of spot sheets is also to some extent affected by humidity, as the distortion of the form and swollen packing may necessitate more patching.

(e) Placing and setting of rollers also is included in make-ready time, and if they are shrunk or swollen, soft or hard, due to weather changes, not only minutes but hours of extra time will be consumed in the endeavor to secure the perfect rolling contact so necessary to a good job. Then there is the not uncommon disaster of melted rollers which completely upset production.

(f) The setting of the fountain is also affected by atmospheric conditions insofar as the condition of the stock and rollers affects the quantity of color to be run.

(g) Finally, the condition of the stock and small amounts of static may increase the amount of time required for setting the feeder.

Make-ready time is a chargeable but an unproductive operation. Each minute so expended is a minute taken from the production of the impressions for which the customer is paying. A minute less make-ready is a minute more of potential production. Thus it is proper to include savings in make-ready time with running time.

ITEMS AFFECTING PRESS-RUNNING

The effects of weather conditions upon *press running* may be tabulated as follows:

(a) Curved or wavy edged stock due to uneven expansion in the pile may cut production by 50 or so impressions per hour on slightly bad stock, to 100 per cent on stock too bad to feed at all.

(b) Very light stock may have to be fed by hand.

(c) Static electricity, generated by friction in dry air, will slow production by from 5 to 100 per cent.

(d) Slip sheeting, necessitating slowing down of the press, extra crew, and extra bindery time for pulling slip sheets is largely caused by static freezing sheets together and by using excessive quantities of ink due to unsatisfactory conditions of stock, temperature conditions affecting the flow of the ink, and poor distribution due to swollen rollers.

(e) The time for resetting swollen, shrunk, or melted rollers is a considerable factor in reducing press production.

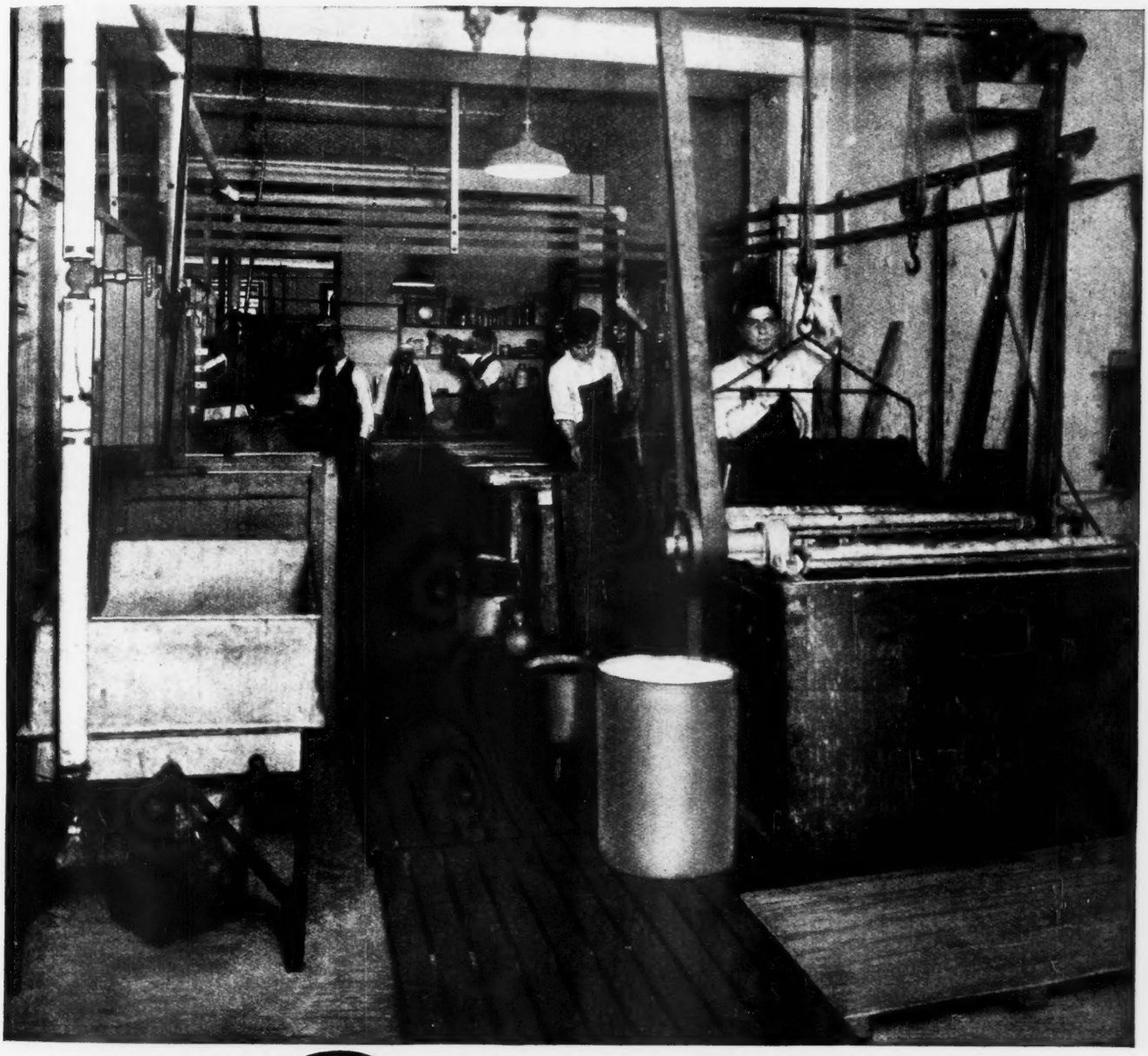
(f) The drying of ink, which sometimes takes place too fast (crystallizing) and sometimes too slowly, is profoundly affected by atmospheric conditions, both directly as temperature and humidity conditions affect the ink itself and indirectly as the conditions of stock and rollers affect the quantity of ink run and possible empirical changes in it made by the pressman. Until we have *standardized weather conditions* there will remain possible only the most uncertain prediction as to how long it will take a given job to dry.

Continued next month

Division Selects Officers

The Printing Industries Division of the American Society of Mechanical Engineers has chosen Arthur C. Jewett, of Pittsburgh, as chairman for the remaining months of the year to succeed Edward Pierce Hulse, who resigned after four years' service. George C. Van Vechten, of the Stecher Lithograph Company, of Rochester, was elected vice-chairman for the same term. Mr. Jewett, who is director of the College of Industries, Carnegie Institute of Technology, also was elected to serve out the five-year term on the committee, expiring December, 1932, and will remain as chairman of the Research and Survey Committee. Mr. Hulse was asked to serve as an associate member of the executive committee. Mr. Van Vechten will succeed as chairman in 1932, with Floyd E. Wilder as vice-chairman, the latter following as chairman in 1933.

It is planned to hold the third conference of Technical Experts in the Printing Industry in New York City in 1932 with the McGraw-Hill company as host, their new 46-story engineering-publishing building being ready by that time. Sessions will be held in the mornings, with the afternoons devoted to discussions and visiting places of special interest, as is the usual custom of the mechanical engineers in their meetings.



Gas-heated solution tanks for chromium plating

THE problems encountered in solution-heating on any scale are quickly and economically solved by the application of gas heat. Gas-heated tanks last longer; modern turndown equipment keeps idle and waiting tanks on an economy basis. The new book "Gas Heat in Industry" tells how others have found gas heat ideal for solution-heating. Write for it.

AMERICAN Gas ASSOCIATION

420 Lexington Avenue, New York

GAS FOR HEAT WHEREVER HEAT IS NEEDED

Your Questions Answered

RULES SLUR AT HEAD OF PAGE

In the April ENGINEER, *M. N. wrote as follows: "I have been having trouble on an 8-page form with 2-point rules at the head of each page. Have done everything I know to eliminate a slur on these rules. The brush, guides and make-ready seem to be all right."*

I am taking it for granted that your gripper bite, bands and brush are propertly set, and that your makeready is also first class, and you have checked same, which you were perfectly right in doing, and from that standpoint I am going to try to point out to you where your trouble is liable to be.

You have said nothing in your question about your rollers. Rollers can get you into more trouble than anything I can think of. If a roller is not properly set, either too high or too low—you will develop dirty, muddy printing. Rollers will slide over rules at the head of a page and there you have a slur.

I am merely mentioning this about the rollers as some pressman may have that kind of a slur and he will know what to look for. But I believe the slur you refer to is caused by the form guttering and you will probably find that your cylinder and bearers are not riding properly. There is a slur when the bearers and the cylinder are not adjusted.

I believe it is good practice to have your bearers and cylinder set at least twice a year by an experienced press erector. By doing that you will get better printing with the least amount of trouble.

W. J. SCHNEIDER, *Pressroom, Wm. Feather Co., Cleveland, O.*

A THOUGHT ON HUMIDITY

Editor, PRINTING EQUIPMENT ENGINEER,
Cleveland, Ohio.

Dear Sir:

The question by G. G. on page 18 of the April issue, PRINTING EQUIPMENT ENGINEER, relative to the possible effect of increased atmospheric humity upon lintoype machines, reminds me of a statement in an article entitled "Profits from Comfort" which appeared in the November issue of the *Industrial Bulletin* of Arthur D. Little, Inc. The statement to which I refer is as follows: "Humidity control in a blade factory accidents from cut fingers to an almost negligible number. The dryness of the inspector's fingers was found to be the major factor."

This suggests that a sufficient amount of humidity in the air of a composing room might enable printers to handle type with great facility.

Very truly yours,
W. E. WINES, *Manager, Mechanical Department, A. N. P. A.*

MODEL 26 DISTRIBUTOR TROUBLE

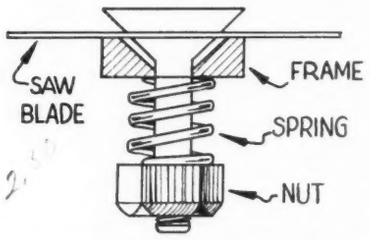
By AL KRUEGER

In the April number, A. C. asks, why, on a Model 26 Linotype, thin matrices drop low enough and catch between the ends of the primary distributor box rails and the bridge. The thin matrices referred to are principally 6-point periods, commas and thin spaces.

Answer. Trouble with thin matrices on a Model 26 Linotype dropping low enough to catch between the end of the primary distributor box lower rails and the bridge is caused by the top of a matrix falling to the left (looking from the rear of the machine) between the distributor screw threads just before the bottom of the matrix has passed to the top of the bridge, and as there is a little gap between the lug on the lower front rail and the bridge, the matrix will become wedged between the two parts.

There are three ways to overcome this trouble. The upper spring in the primary box front plate upper rail should protrude through the slot far enough to prevent thin matrices falling too far to the left, but if the spring does protrude too far from the slot it will prevent thin matrices that should straddle the bridge for the other magazine from dropping properly. In this case, a piece of brass (about 2 points thick) can be soldered to the bridge supporting block, so the gap between the lower front rail and bridge will be closed. After soldering the piece of brass to the block, dress the top edge flush with the top of the bridge bars. Another method which may be used to eliminate this trouble would be to anneal the lower back plate rail and slightly bend the rail lug so it will close in the gap.

A Useful Tool



Diagrammatic sketch in cross-section showing construction of the Sloan saw-swaging tool arbor.

Many ingenious mechanical devices have been originated by different machinists throughout the country. These devices have been created, in some instances, to avoid difficulties in certain phases of the work. Devices of various kinds have also been developed because replacement parts were not at hand and the emergency demanded an immediate repair of some kind. In other instances, tools have been developed in order to simplify certain work or to do better work. In this latter class falls a device submitted by Harry E. Sloan of Philadelphia.

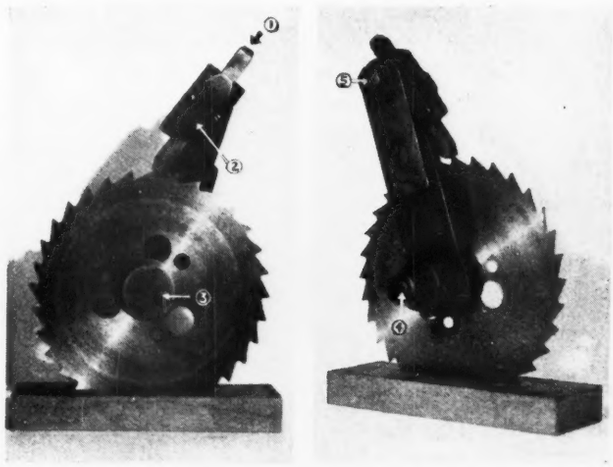
Much experience is required before one can become proficient at swaging saw teeth by hand. It is also essential that a light hammer be used with which to strike the swage. The difficulty in holding a swaging tool by hand at the proper angle is well known. In Mr. Sloan's device the swage is automatically held at the correct angle to burr the teeth tips, so that each tooth tip will be formed alike, providing the hammer blows are constant.

To use the device, place a saw on the arbor and clamp the blade in a bench vise having leather-faced jaw liners. Each tooth will be accurately swaged because the swaging tool is held at a fixed position in relation to each saw tooth. The coil spring indicated in the line drawing holds the saw blade firmly against the tapered head of the arbor and permits rotating the fixture while swaging the teeth.

A hole 1/8 inch in diameter is drilled in the tool about 1/8 inch above the apex of the "V." This hole prevents any tendency of the lips to split.

In the line drawing it will be seen that the arbor is fitted with a tapered head so as to accommodate saw blades having various size arbor holes.

The flat steel tension spring which bears against the swage shank is made from 0.025 inch spring steel.



Front and back views of a combination saw arbor and swage holder which is used while swaging the teeth of composing room saw blades. The swage is indicated at 1, flat steel tension spring at 2, the arbor at 3, the arbor lock nut at 4 and the adjusting screw which locks the swage guide at 5. The block in which the saw rests is merely used for photographic purposes. The stereotype saw of 32 teeth is shown because it better illustrates the device than the usual one of 64 teeth.

This device is at present being used in a composing room where 10 saw-trimmers are in daily operation.

Books Received

We have always maintained that a craftsman should possesses a collection of technical books, however small, pertaining to his branch of the Printing Art for reference purposes. The technique of the profession is too complicated for the average worker's brain to be made into a storehouse of information from which a much-needed detail might be drawn at a moment's notice.

One of the recent books which should fittingly occupy a space in a technical collection of books is "Questions and Answers," by Thomas E. Dunwody, editor of *The American Pressman*. This book represents a collection of the latest methods relative to problems araising in the modern commercial pressroom.

The chapter titles are as follows: Inks, mixed inks and reducers; overlays, mechanical and chalk; Register; Slipping Between Bed and Cylinder, causes, effects and remedies; Offsetting; Packing; Rollers; Makeready, analyses and methods; Slurs and Streaks. The heading, "Miscellaneous," shows that various subjects not listed above are treated under a wide variety of titles.

While the book is properly classified in such a way as to permit easily finding the answer to any particular query, it could be greatly improved by the addition of a detailed index. This is a minor fault and does not greatly detract from the usefulness of the knowledge contained within the covers.

"Questions and Answers," by Thomas E. Dunwody. Compiled by Edwin A. Kilheffer, Associate Editor, *American Pressman*. Contents pertain to presswork and pressroom management. Size 5¾x8¾ inches, 182 pages. Price, $2.00. Published by Technical Trade School, Pressmen's Home, Tenn.

BURGESS
"CHROME" MATS
A LABORATORY PRODUCT

WET MATS

Burgess "Chrome" Wet-tex Mats are designed to fill the need for a really high grade wet mat. This mat was made for superior ad-mat work, as it has characteristics to take and hold fine screen halftones.

Burgess "Chrome" Wet-tex Mats are of the same construction as the Burgess "Chrome" Dry Mat—no paste being used in them—but treated especially to permit their being used in a saturated condition.

Burgess "Chrome" Wet-tex Mats are economical and easy to handle. They may be conditioned simply by placing in a tank of water for from twenty to twenty-four hours, absorbing in this time approximately 58% moisture, and then used in the same way as the paste and tissue mat.

Burgess "Chrome" Wet-tex Mats will dry in from one to three minutes with 80 lbs. steam pressure. They will not blister nor stick to bearers regardless how hot they become. The finished matrix is flexible, full of life and will not fracture easily. The face of the type and solids has a highly polished effect due to the special facing, producing the finest of printing plates.

If you are not using Burgess "Chrome" mats you are invited to write for samples.

It will pay you to do so, for if these mats can give you better results . . . and the experience of several hundred publishers, printers and advertisers proves that they will . . . they are the mats that you should be using now.

Won't you write . . . today . . . for samples?

As a further convenience and service to our customers, we are in a position to take care of your requirements for Stereotype Department Accessories of all kinds.

STEREOTYPE MAT DIVISION

C. F. BURGESS LABORATORIES, Inc.

Manufacturers of cellulose, acoustic and electric products

111 W. Monroe St. Chicago, Ill.

Automatic Color Analysis

(Continued from page 7)

must be subject to the unavoidable heat associated with intense light is usually negligibly short.

The light output of any lamp depends upon the voltage applied to the lamp and varies if the voltage varies. For purposes of setting the voltage at the same value for both the standard white and the test sample, and for showing whether or not the applied voltage changes, a recording voltmeter is included in the instrument.

There is one important benefit from this method of illumination. Surface finish has an undoubted effect upon the sensation produced upon the eye, aside from the color. The eye integrates both these effects, but in an instrument it is highly desirable to separate them. This method of illuminating the sample effectively eliminates all surface conditions.

The light-dispersing unit consists of a spectrometer, or rather, of a collimator tube, a prism, and a telescope tube, without any divided scale. It is designed primarily for intensity, that is, the lenses have large aperture and short focal length. Since constant deviation is most convenient, and may be had by one refraction and one reflection, a mirror was introduced as the reflecting surface. Only the mirror moves when the color emerging at the exit slit is changed. Of course, only one wave length is at minimum deviation, generally Hg green, 546 millimicrons, but this fact is of no importance so long as it is recognized when designing the other parts of the instrument.

The slits of the spectrometer are automatically adjusted during the operation of the instrument to keep a predetermined wave length band, 10 millimicrons, falling on the photoelectric cell and to compensate for the characteristics of the cell.

The light-measuring unit consists of a photoelectric cell and a very sensitive vacuum tube amplifier. Its action may be summarized as follows: The light emerging from the exit slit of the spectrometer is allowed to fall upon the sensitive surface of the photoelectric cell. The current thus generated by the cell is amplified by one vacuum tube. The change in plate current of this vacuum tube flows through a galvanometer, causing it to deflect. The deflection measures the light incident upon the photo electric cell.

That this deflection may be taken as a measurement of the intensity of the light has been proved by a series of very careful and accurate tests. It was found that the galvanometer deflection is strictly proportional to light intensity, more accurately than the galvanometer can be read. This was shown to be true for light values from zero to three or four times the maximum used in the instrument.

The indicating and recording unit consists of a photographic plate holder, a visual scale, two galvanometers and a beam of light. The plate holder is mounted in vertical guides and can be moved by rotating a small crank which also automatically changes the color falling upon the photoelectric cell from one limit of the visible spectrum to the other, maintains constant purity throughout the spectrum, and compensates for the characteristics of the photoelectric cell. Very close in front of the movable plate holder is mounted a fine horizontal slit which has a shutter operable by a small lever which makes it possible either to take a photographic record or not, as desired.

The beam of light comes from a straight line filament bulb mounted at one side. It passes through the lens to the mirrors of the galvanometers back through the same lens, to be focused in the plane of the photographic film. For visual observation, the lower half of the image of the straight line filament is reflected by a plane mirror, set at 45° to the beam of light, to the visual scale mounted in the front panel of the instrument.

A voltmeter having a small mirror mounted on its needle is also placed in the light beam compartment, so that the voltage applied to the illumination unit may be set, by the rheostat, and recorded on the photograph.

The instrument is adapted for the use of standard 3¼ by 4¼ inch film. Coordinates are printed on the film from a negative when a light bulb is switched on. Every 10 millimicrons is indicated on the coordinates, and every 2 per cent on the reflection factors. Estimation to a quarter of a division, which is very comfortably done on this size record, gives readings to a half of 1 per cent, sufficient for most problems.

An identification number which may be set from

JOERNDT'S NU-WAY TYPE CASES

Steel California Cases fit your cabinets, never will break, each

$5.00

$1.00 credit on all wooden cases replaced

Steel Nu-Way Cases, fit your cabinets, for 42-48-60 and 72 point—each . . . . . .

$5.00

Write for prices on Type Cabinets, which hold 28 cases instead of 24.

FRED. M. JOERNDT

Transportation Bldg. CHICAGO

the front panel of the instrument is printed on each film. This is found to be a great convenience when several records are developed together. It is possible to take several curves on the same film, and in the case where the colors are nearly alike, one record may be a dotted, and the other a solid line, which can also be controlled by a switch on the front panel.

The operation of the instrument is as follows: With both the amplifier and the illumination unit turned on, the galvanometer is adjusted to read zero. Standard white ($MgCO_3$) is then placed over the sample opening and the crank is turned. The sensitivity of the galvanometer is adjusted until the reading is just 100. Then the crank is turned backwards to the end of its path, the sample to be tested is placed in the place of the standard white, and the crank again turned. When the wave-length scale reads 400 millimicrons, the shutter is opened, exposing the film to the action of the small point of light that comes through the fine horizontal slit. At a reading of 700 the shutter is closed, and the crank is turned back to the end. Now a switch is turned, which throws on a light that prints the coordinates and the identification number on the film, and the record is ready for development.

The time required for turning the crank moving the photographic-plate holder through its path is about 10 seconds. Three or four seconds for coordinates makes a total of about 15 seconds for a complete record, outside of development of the film. Development and preliminary fixing require no more than a minute or two. Hence a record is ready for inspection less than 3 minutes from the beginning of the operation.

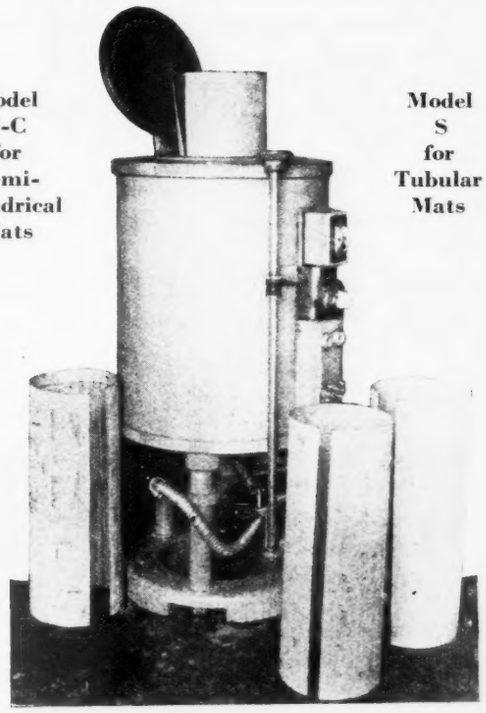
In testing very dark samples, the amount of light reflected from the specimen under test is quite small compared to the amount of light reflected from the standard white. Taking advantage of the fact that under normal operation, our instrument is not used at its maximum sensitivity, it is possible to provide a means for magnifying the vertical scale. This is accomplished by building into the instrument, two galvanometers, one used for normal operation, and the other at a sensitivity two and one-half or five times as great. That is, if the primary galvanometer shows a deflection of 10 per cent, the second galvanometer will show a deflection of either 25 or 50 per cent, depending on the position of a selector switch on the front panel.

In cases of close differences, the two magnified records should be used, rather than the primary records. This magnification can also be used in studying close white samples, by debalancing until the primary white curve is sufficiently low to allow the magnified record to remain on the scale.

Metal Market

	March 16	*April 15*
Straits Tin	$27.15	$25.25
Electrolytic Copper	10.12	10.00
Prime Western Zinc	4.00	4.10
A. S. & R. Lead	4.50	4.50
Antimony	7.37	6.85

FORM-O-SCORCH
Centrifugal Matrix Scorcher



Model S-C for Semi-Cylindrical Mats

Model S for Tubular Mats

MODEL S MACHINE

The new Form-O-Scorch Precision Dry Mat Former and Scorcher is the product of experts and engineers in the newspaper field.

This machine is FAST as it SCORCHES and FORMS under centrifugal force with a BLAST of hot air circulating on BOTH SIDES of THE MAT.

Buckles, Cups and Concaves are removed from any make of matrices instantly and scorched at any degree of heat you desire.

England, Germany and France acknowledge this type of machine to be far superior to all others and is in general use all over Europe.

Consult us at once and we will show you how to save time and money with perfect results.

Manufactured by

American Publishers' Supply Company

P. O. Box 131, West Lynn, Mass.

Agents Any Printing Press Mfg. Co.

Agents Any Dry Mat Mfg. Co.

A Victory
for Wood Dry Mats

THE award of the Ayer cup to the *New York Herald-Tribune* for typographical excellence indicates the value of the Wood New Process Coated Dry Mat.

In deciding the award on the basis of three points—

1. Presswork
2. Typography and
3. Make-up

the judges paid tribute to the foundation upon which typographical excellence is built—the satisfactory dry mat.

The success that the *Herald-Tribune* derives from Wood Coated Dry Mats is clearly demonstrated in this unusual award.

WOOD
FLONG CORPORATION
HOOSICK FALLS, N.Y.

Routing Work Flow

(Continued from page 8)

sheet has been prepared to determine the most natural and effective method of routing work through the various operations of the plant.

PLANNING THE FLOW SHEET

Inasmuch as the receipt of raw materials is the first act in producing the printed piece, it is natural that the receiving department should be the first to find its place on the flow sheet. The receiving department will, of course, derive its location from the fact that it is easy of access from both roadway and railroad siding if there is to be a siding. Since it is almost invariably advisable to use the same roadway and siding for shipping as for receiving, the shipping department will probably find its place adjacent to that allotted to the receiving department.

From the receiving department, the raw material must be placed directly in stores. Since paper is the major raw material of the printing industry, the paper stores will next be located near the receiving department. Obviously, the pressroom must be adjacent to the paper stores, at least in a one-story building, so the general location of the pressroom should next be set apart. After printing, three things may happen to the printed paper. It may go directly to the bindery for the further operations, the flat sheets may be sent to another bindery for completion, or they may be stored for future orders from the customer.

ACCESSIBILITY OF PRESSROOM

These three possibilities must be accounted for. At the same time, they may not be considered before the proper space has been allotted to the composing room since the direct flow of work from the composing room to the pressroom must be arranged. It appears here that the pressroom is the point about which most of the other departments must revolve. The pressroom must be accessible from the paper stores and from the composing room, and, itself, must be accessible to the bindery, the finished goods storeroom, and the shipping room. If the earlier flow sheet forced the pressroom into a corner, it will now appear necessary to start over entirely fresh.

Flow sheets may be prepared for the one-story plant which sweep the work straight through the building and out the other end from that at which it started; or a more nearly square floor plan, may make it advisable to route the work around the room, having it finish at a point adjacent to that from which it started. Multi-story buildings may be arranged to take advantages of natural features to as great an extent as can one-story buildings. The flow sheet which take advantage of all natural features and which permits a direct routing of work through the plant is of inestimable help in the further operation of making the actual plant layout.

Pre-Makeready Methods

(Continued from page 13)

tones has simply been a matter of precision and mechanical application, the perfection of which has brought about its successful operation without damage to materials being molded. This new hydraulic molding press is another contribution to speed and precision in platemaking. It is designed to eliminate costly makeready time, the greatest bug-a-boo of the printing industry. Makeready is caused by mechanical error which we have relieved and eliminated to a great extent through mechanical precision of machine operation.

OBSTACLES OVERCOME

When direct pressure molding was first introduced into this country by German and Swiss inventors, its advantages were instantly recognized, but the molding equipment which they offered was too slow in action, too weak in construction, and too inaccurate to meet American production standards. We have accomplished seemingly impossible results never before obtained in halftone reproduction in mat molding.

This press not only molds but calendars the mat to an exact thickness, eliminating the necessity of sandpapering rough spots on the back of the mat, which, if not removed, reflect imperfections in the face of the cast plate. This press is guaranteed to mold up to a pressure of 2,000 tons, and is built sufficiently overcapacity to continue to operate up to its fullest pressure during years of constant operation.

In building this precision equipment, we had especially in mind the accuracy and register necessary in producing mats for color work, and the facilities for molding mats to register have been provided.

Task of Exposition

One of the things that the Century of Progress Exposition hopes to do is to teach the people who attend to appreciate beauty, according to Dr. Allen D. Albert, assistant to the president of the Century of Progress Exposition, who spoke before the Society of Typographic Arts at the present showing of examples of Chicago Fine Printing at the Newberry Library.

"It is the task of the Exposition to correct the misinterpretation that this is wholly an age of mechanics," he stated, "and to seize upon the extra-production ability of this age to make sure that the life of products is not cheapened through the zeal of quantity production.

"The World's Fair will endeavor to paint a picture of the industrial ascendancy of tomorrow and point out the absolute necessity of continuous research in industry through the exhibits, one of the most attractive of which will be display of the graphic arts."

A combination fabric and rubber endless belt for Linotype and Intertype assembler drives has been placed upon the market.

Every MACHINIST NEEDS THIS TOOL

The Curle Matrix Anvil

TOOL AND GAUGE ASSEMBLY

—is an economical, complete and compact piece of equipment that should be used by every machinist or machinist-operator for reconditioning Linotype or Intertype Matrices. This Tool and Gauge Assembly soon pays for itself. Here are a few of its uses.

It enables you to determine quickly whether a Matrix is worth repairing—it helps you to clean and straighten dirty and bent matrices—it restores worn Matrix Lugs (if not too badly worn)—corrects irregular face alignment—the tapered Gauge provides a means of determining spacing between combination teeth—a spaceband gauge helps determine spaceband measurements and indicates whether the wedge is distorted or whether the sleeve lugs are too wide.

The Curle Matrix Anvil is the best remedy for Linotype or Intertype Matrices that have become bent in the body or lugs—for combination teeth becoming bent or spread too far apart—for matrices that do not align properly, or cause "blockups" or sticking characters on account of defective lugs.

Aren't these reasons enough why you should have a Curle Matrix Anvil Tool and Gauge Assembly? This Assembly means better work in less time—makes your work easier. Prove this for yourself—let us send you The Curle Matrix Anvil, Tool and Gauge Assembly for a 10 days free trial. Send the coupon and we will send the Assembly.

Dealers wanted in United States and Foreign countries.

GEORGE L. CURLE CO.,
44th and Zenith Ave., So., Minneapolis, Minn.

Gentlemen:

You may send us a Curle Matrix Anvil for 10 days' free trial. The price is $36.00 f.o.b. Minneapolis, subject to following terms: 3% 10 days, or 30 days net.

Name of Publication .....

Signed by .....

Address .....

City ..... *State* .....

Certified Is True Economy

In *Editor & Publisher* for March 14th, 1931, The International Printing Ink Corporation in its advertisement told of a publisher "who changed his mind . . . and brought home the bacon."

■

They brought home the story which we ourselves have been bringing home to many publishers; that there is a brand of "economy" which is expensive.

■

By going back to better ink, better newsprint, better metal and better mats, publishers are able to produce better papers—clearly and cleanly printed papers—which are easily read and make for happy and contented readers and advertisers.

■

Certified Dry Mats have always been made and sold on the basis of printing quality—with one price to all without discrimination or favor. Certifieds have not and will not be cheapened in quality to be sold at a price.

■

If you are not satisfied with the appearance of your paper, and if your readers and advertisers are complaining, we respectfully suggest that you try a case of Certified Dry Mats in your stereotype foundry. And back to better ink, better newsprint and better metal, too. That's true economy.

■

Forget price! Use quality at the right price! It pays!

CERTIFIED DRY MAT CORPORATION

338 Madison Avenue New York

For dependable stereotyping—use Certified Dry Mats

Made in U. S. A.

Latest Printing Equipment Mechanisms

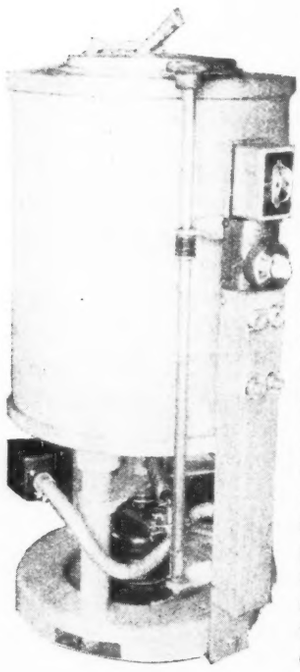
Linotype Swinging Keyboard

The unique, exclusive mobility feature of Linotype's swinging keyboard brings instant accessibility to every keyboard part. It gives the same freedom in reaching any part of the keyboard mechanism that removing a keyboard to the work-bench would provide.

No fumbling or groping in the dark—no trying to work in uncomfortable, cramped positions—it's now a simple, easy

operation to remove back cam yokes, stopping strips or reach any moving keyboard part for cleaning and servicing attention. The uniform tension of simple overthrow springs prevent the keyboard cams from cutting into the rubber roll. These springs are positive and dependable in action, and require no adjustment. Many other advantages made possible by this unique, exclusive Linotype feature will instantly be apparent to every machinist and operator.

Form-O-Scorch



Form-O-Scorch, the new stereotype matrix former and scorcher, created unusual interest at the publishers' convention at the Pennsylvania hotel in New York City. Novel ideas have been advanced by the inventor through introducing heated air under high circulation, giving uniform shrinkage and scorching, and the utilization of centrifugal force to form the mat into a perfect casting medium by removing all imperfections in the matrix. The heat in the scorcher is applied through electric heating units which are at all times under thermostatic control. In case it would be necessary to replace heating units, if ever, the outer drum of the scorcher is quickly removable which exposes and makes accessible the entire heating system. The tubular scorchers and semi-cylindrical machines are built upon the same principle. Heat losses are reduced to the minimum as the scorcher is thoroughly insulated. Scorching stereotype matrices under centrifugal force is now the general practice through-

out Europe. This type of scorcher is now being introduced into America with improved ideas by the American Publishers' Supply Co., of West Lynn, Mass.

Joerndt's Nu-Way Type Storage System

The Nu-Way type storage system was designed by Fred M. Joerndt of Chicago for the stroing and handling of type. The system eliminates extra handling and storage of type and saves over 30 per cent floor space.

A steel California case hold 3 cubic inches more type than a wooden case and outlasts it by many years.

The Steel Nu-Way case is made to hold display type 42, 48, 60, 72 points and any larger sizes needed. The 42-48 point cases hold over 120 pounds of type and the 60-72 point cases hold approximately 85 pounds. The case needs to be pulled out only 5 inches to make every letter or character accessible. A special cabinet is also designed to hold 28 cases in place of the usual 18 or 24-case cabinets now used. The cabinet is standard height and any style working surface or slug rack can be furnished.

In all other systems now used it is necessary to provide extra storage, but this is not true with Joerndt's Nu-Way system. Write for complete details to Fred M. Joerndt, Transportation Bldg., Chicago, Ill.

Baskerville on Linotype

The Mergenthaler Linotype Co. announces the cutting of Baskerville for the Linotype, under the supervision of George W. Jones, the eminent English printer.

"The unusual dignity and beauty of Baskerville is at once apparent. Its capitals are sturdier than those of Caslon, which

HERE is a showing of Linotype Baskerville in combination with *Italic* and SMALL CAPITALS in the 14 point size.

face it resembles in many of its characteristics, and the contrast between the thick-and-thin elements of the letters is more marked."

Linotype Baskerville will be cut in a complete range of sizes. Sizes up to and including fourteen point are available in combination with italic and small capitals. Special "f" logotypes in both roman and italic are available for fine composition.

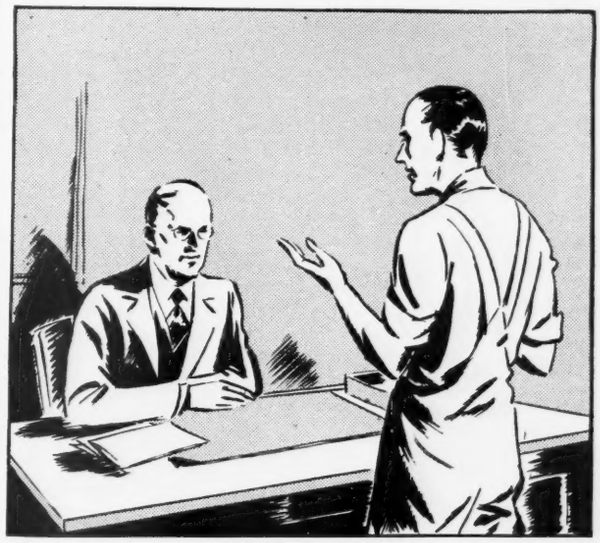
Highlight Halftones

(Continued from page 10)

The Bassani method of rotating the screen also produces very good results, but whatever method is used, do not expect that all negatives will pass without the use of some painting or brush work.

Cooperation upon the part of both the artist and the photographer will do more than anything else to guarantee the production of highlight plates which will print well and please the advertiser.

The reference to the depth of a 65-line halftone in the April issue should have read 0.0045 inch instead of 0.045 inch as printed. We trust that our readers knew what was meant, and make this correction for the benefit of those who might have been confused.—ED.



"It May Take Some Arguing to Convince the Boss . . .

—that you should switch to Imperial Type Metal," says the head stereotyper to his friend on another paper.

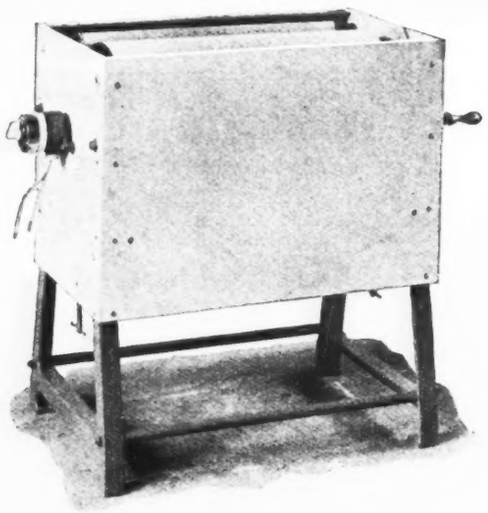
"I remember when the front office used to buy our metal on a cost per pound basis. The lower they could get the price the smarter they thought they were. One day I got up my dander, I walked right in to the boss and told him that as long as this outfit insisted on buying just any kind of type metal so long as it was cheap, they could not expect me to make a good showing in the Stereotype Department."

"I remember he said to me 'Well, if you think you could do better, suppose you buy the metal and we will see how our costs run at the end of the year.' That was exactly what I wanted him to say and I chose Imperial Type Metal serviced by the Plus Plan. The boss was a good sport and came around at the end of the year and said, 'Jim, you win. From now on you handle this metal business.' . . . My advice to you is to have it out with the boss and then

switch to

Imperial METAL

THE IMPERIAL TYPE METAL CO.
Philadelphia · New York · Chicago · Los Angeles



Cemer Electric Matrix Scorchers

***Form* and *Scorch* Mats RIGHT**

One Operation, One Heat

Pleased customers who have given repeat orders:

The Times, New York City, 5	Daily News, Chicago, 3
Evening Journal, New York City, 5	The Times, Washington, D. C., 2
Herald-Tribune, New York City, 3	The News, Buffalo, New York, 2
Daily Eagle, Brooklyn, N. Y., 2	Post-Enquirer, Oakland, Calif., 2

Write us for particulars.

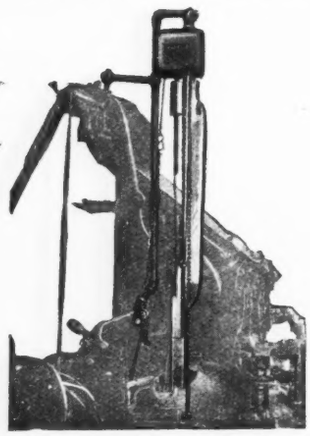
J. V. CEMER

85 Cleveland Street Battle Creek, Michigan

THE MARGACH

Automatic Metal Feeders

for



Linotype
Intertype
Monotype
Ludlow
Elrod

No other article in the Printing Industry can answer its purpose more effectively than the Margach Feeder, which not only sells for the moderate price of $75.00, but its life of 100% efficiency is guaranteed for ten years—and will undoubtedly last indefinitely, 10,000 users can testify to this. Among our sales representatives are the Intertype Corporation, Lanston Monotype Co., and the Ludlow Typograph Co.

MARGACH MFG. CO., INC.

HERMAN DIAMOND, President

213 CENTRE STREET NEW YORK CITY

The Stereotyper's Difficulties

By One Who Knows

IT HAS been generally accepted that the dry mat, now used almost universally on newspapers, requires more pressure in molding than the wet mat. But this defect is offset by the saving in white paper because of the page shrinkage. This saving, however, would not of itself continue the use of the dry mat were it not for the fact that halftones are reproduced with greater fidelity and depth. I only mention these well-known facts to dwell upon the new problems every newspaper stereotyper faces at the present time.

The greatest of these perhaps, next to the fundamental difficulty of sending it to the caster flat and without "buckles" and kinks, lies in the molding itself. If sufficient "squeeze" is used to get all there is in a halftone the type matter suffers. If type matter is to be protected halftones lack depth and print poorly. Right here the stereotyper is between "the devil and the deep blue sea."

Linotype, Ludlow and Elrod machines function best with an alloy somewhat softer than stereotype metal. This aggravates the molder's troubles. Technically, pressure can be reduced on straight type forms and increased again on pages containing art, but this change in pressure also has its disadvantages for blackface type also requires pressure to secure the smoothface surface, without which the pressman cannot bring out his "blacks."

Hardening of the backing metal used in electrotyping (experiments are now being made to secure this) will be a help and assist in placing the electrotype in the pressure-resisting class in which the zinc cut now is supreme. If the type composing machines mentioned can be perfected to use a harder metal alloy than used at present, it will reduce the reset and remold problem. The elimination of all air holes in machine-made lines, slugs, leads and rules will also be a great help.

Understand, please, all of this is not submitted to free the stereotyper of labor—rather it is submitted to make his labor productive of better and more beautiful work, which at present with all his efforts is hardly possible. We exercise vigilance but the editions must go to press and after the "Last" is down, going back to remedy cut, type or rule is out of the question.

The demand for speed and production has robbed the stereotyper of the time necessary for perfect work. I refer here directly to the casting of flat stereotypes from job mats which serve as patterns in the page form for re-stereotyping. If each job mat could be handled separately from start to finish the result would be a good cast, careful sawing and trimming, routing, mortising, and—shaving to 0.918 inch, or 0.920 inch for halftones. But this will materially increase the force. As it is, the work must be done in a wholesale manner. By that I mean the universal custom of pasting job mats together, the number being limited only by the size of the casting box. Wholesale shaving again

prevents accurate type-highing or attaining a 0.002 inch tolerance. Reconciling these variations in height together with safeguarding hand type and electrotypes requires the utmost skill in molding.

With the increasing use of hard cork impression blankets on the press, a true plane surface on the stereotype plate is absolutely necessary. To attain this, metal with a tin content of 7-13-80 formula—which daily drossing gradually reduces to 6-13-81—must be given close attention, both as to cleanliness and segregation. Unlike all type and rule or lead-casting machines in which the molten metal is forced into the mold mechanically, the stereotyper must depend entirely upon the specific gravity of his metal in making each cast.

And after all is done, looking for—and more frequently finding—defects in the printed paper, is perhaps, one of the greatest troubles of the stereotyper.

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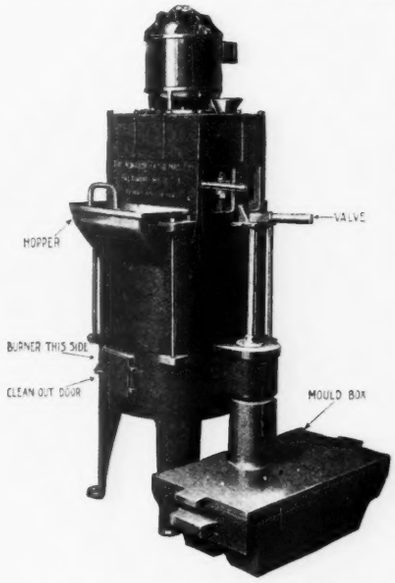

It occupies but two and one-half feet of space and is placed preferably near the larger stereotype pots from which the dross is skimmed. The dross can be immediately thrown into the Renovator, thus eliminating storage of same in cans and the packing for shipment to the smelter.

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Grinding Rubber Rollers

(Continued from page 9)

The grinding wheel revolves at the rate of 2400 r.p.m. and the wheel is positioned at a 45-degree angle to the axis of the roller.

The unit is mounted at the rear of the lathe carriage in such a way that the grinding wheel has contact with the top of the rubber roller at a central point. A regulation hand-feed crank determines the working contact of the wheel vertically in relation to the roller in order to determine how much of a cut shall be taken.

Two grades of wheels are used, both 10 inches diamter by 1-inch face. One wheel is composed of 16-grit carborundum which is used for the roughing cut. The other, which is 60-grit, is used for the finshing cut.

THE DUST COLLECTOR

The grinding operations remove fine particles of rubber from the roller. If these were not drawn off by some means they would be thrown over a considerable area. In order to prevent this, a dust collector *4*, Fig. 1, which is operated by a 1 h. p. motor and blower *18*, Fig. 2, is connected to the grinding unit by a nozzle *2* and flexible tubing to accommodate movement of the grinding unit to and fro over the work. The wheel is covered with a sheet iron guard *1* which is attached to and forms a part of the nozzle. The suction created by the fan *18*, Fig. 2, is sufficient to draw 98 per cent of the rubber particles into the collector *4*, Fig. 1. It will be noted in Fig. 1 that a canvas sleeve *3* connects the grinding unit nozzle and the flexible tubing. This sleeve was found to be the remedy for vibration in the grinding wheel caused when the intake nozzle and flexible tubing were directly connected.

THE POLISHING OPERATION

Mr. Pentland devised a clever mechanism which he claims is the real secret for automatically obtaining the proper finish and true surface on rubber rollers. This device is described in the caption for Fig. 2.

OPERATION OF THE GRINDER

It is possible to grind and polish a 7-inch rubber roller in about 5 hours; 4 or 5-inch rollers can be completed at the rate of 3 per day.

As has been stated above, the grinding wheel operates at a speed of 2400 r.p.m. In the roughing cut a 7-inch roller turns 34 r.p.m. and the carriage travels about 1/32 inch per revolution of the roller. The polishing speed of the roller runs up to 400 r.p.m.

When a 5-inch (or smaller) diameter roller is mounted in the machine, the grinding speed is 54 r.p.m. and the polishing speed is 650 r.p.m.

The average operation requires one roughing cut across the roller with the 16-grit wheel, a polishing cut with the 60-grit wheel and several cuts with the Aloxite sling, all depending upon the cure of the rubber stock in the roller, or until all checks in the surface have been removed. The final operation consists of holding a folded ducking cloth against the roller to obtain a clearly polished surface.

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